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Changes in CO₂ emissions from China's energy-intensive industries: A subsystem input-output decomposition analysis

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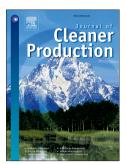
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- 1 Changes in CO₂ emissions from China's energy-intensive industries: A
- 2 subsystem input-output decomposition analysis
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7 Abstract

8 This paper presents a subsystem input-output model to analyse the patterns behind the evolution of CO_2 9 emissions in energy-intensive industries. Two emissions accounting principles (the production 10 accounting principle and the consumption accounting principle) are applied. The embodied CO₂ 11 emissions are divided into the production-based CO₂ emissions associated with three components (internal component (IC), external component (EC) and demand level component (DLC)) in addition to 12 13 the CO₂ emissions identified by the indirect component (INC) from a consumption perspective. A 14 structural decomposition analysis is further conducted to decompose the emissions changes into 3 15 effects, which are the emissions intensity effect (ET), the technological effect (TT) and the demand 16 effect (DT). The results show that the external component is primarily responsible for increased CO_2 17 emissions and the demand effect is the key factor in the decrease of CO_2 emissions. Moreover, sectors 18 with a positive difference between production-based and consumption-based emissions are more 19 sensitive than the others to the technological changes. Thus, different measures should be adopted by 20 considering sectorial realities.

Keyword: CO₂ emissions; Energy-intensive industry; Subsystem input-output model; Structural
 decomposition analysis

23 Highlights

- The patterns behind the evolution of CO₂ emissions in China's energy-intensive industries are analysed from both production and consumption perspectives.
 A subsystem input-output decomposition analysis is employed to explore the factors behind CO₂ emissions changes in China's energy-intensive industries.
 The pulling effect of non-energy intensive industries on the CO₂ emissions in energy-intensive industries is discussed.
- The policy implications of the results from China's energy-intensive industries are analysed.
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